CLAIMS:

1. A magnetocaloric effect heterostructure comprising:

a core layer of a giant magnetocaloric material; and

an elastically stiff material layer coated on at least one surface of said core layer, said elastically stiff material layer restricting volume changes of said core layer during application of a magnetic field to said heterostructure.

2. A magnetocaloric effect heterostructure as defined in Claim 1, wherein said core layer of giant magnetocaloric material is a compound of $Gd_5(Si_{1-x}Ge_x)_4$.

3. A magnetocaloric effect heterostructure as defined in Claim 1, wherein said elastically stiff coating layer is a low-coercivity, high-magnetization material.

4. A magnetocaloric effect heterostructure as defined in Claim 3, wherein said coating layer of low-coercivity, high-magnetization material comprises an element selected from the group consisting of iron, cobalt, nickel and magnetic oxides.

5. A magnetocaloric effect heterostructure as defined in Claim 1, wherein said elastically stiff material layer is coated on opposite surfaces of said core layer.

6. A magnetocaloric effect heterostructure as defined in Claim 1, wherein said elastically still material layer substantially encapsulates said core layer.

7. A magnetocaloric effect heterostructure as defined in Claim 1, wherein said coating layer is applied to said core layer using a chemical vapor deposition process.

8. A magnetocaloric effect composite powder comprising a plurality of core particles of a giant magnetocaloric material, each of said core particles being encapsulated within a coating of elastically stiff material, said elastically stiff coating restricting volume changes of said core particles during application of a magnetic field thereto.

9. A magnetocaloric effect composite powder as defined in Claim 8, wherein said giant magnetocaloric material of said core particles is a compound of $Gd_5(Si_{1-x}\ Ge_x)_4$.

10. A magnetocaloric effect composite powder as defined in Claim 8, wherein said elastically stiff coating is a low-coercivity, high-magnetization material.

11. A magnetocaloric effect composite powder as defined in Claim 10, wherein said coating of low-coercivity, high-magnetization material comprises an element selected from the group consisting of iron, cobalt, nickel and magnetic oxides.

12. A magnetocaloric effect composite powder as defined in Claim 8, wherein said core particles are substantially spherical.

13. A magnetocaloric effect composite powder as defined in Claim 12, wherein said core particles have a diameter of about 30 μm and said coating has a thickness between 50nm and 200nm.

14. A magnetocaloric effect composite powder as defined in Claim 8, wherein said coating is applied to said core particles using a chemical vapor deposition process.

15. A method for enhancing the magnetocaloric effect within a giant magnetocaloric material comprising the step of coating a surface of said giant magnetocaloric material with an elastically stiff material, said elastically stiff material restricting volume changes of said giant magnetocaloric material during application of a magnetic field thereto.

16. A method as defined in Claim 15, wherein said giant magnetocaloric material is a compound of $Gd_5(Si_{1-x}\ Ge_x)_4$.

17. A method as defined in Claim 15, wherein said elastically stiff coating is a low-coercivity, high-magnetization material.

18. A method as defined in Claim 17, wherein said coating of low-coercivity, high-magnetization material comprises an element selected from the group consisting of iron, cobalt, nickel, and magnetic oxides.

19. A method as defined in Claim 15, wherein said giant magnetocaloric material is coated on opposite surfaces.

20. A method as defined in Claim 15, wherein said giant magnetocaloric material is substantially encapsulated by said coating.

21. A method of enhancing the magnetocaloric effect within a giant magnetocaloric material comprising the step of restricting volume changes of said giant magnetocaloric material during application of a magnetic field thereto.

22. A method as defined in Claim 21, wherein said volume changes of said giant magnetocaloric material is restricted by a coating of an elastically stiff material.

23. A method as defined in Claim 22, wherein said elastically stiff material is a low-coercivity, high-magnetization material.

24. A method as defined in Claim 23, wherein said low-coercivity, high-magnetization material comprises an element selected from the group consisting of iron, cobalt, nickel, and magnetic oxides.

25. A method as defined in Claim 21, wherein said giant magnetocaloric material is a compound of $Gd_5(Si_{1-x}\ Ge_x)_4$.